MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2019 / 2020

PCO0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM

(Foundation in Information Technology)

2 MARCH 2020
2.30 p.m – 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages (excluding the cover page) with 5 questions only.

2. Answer **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

a. Explain briefly the distinction between computer organization and computer architecture.

(3 marks)

b. Explain briefly **TWO (2)** characteristics of a computer design in the first generation.

(2 marks)

c. Processor organization describes the interconnection of the major components of a CPU to the rest of the computer system via the system bus. List and briefly describe **TWO (2)** of the tasks that the processor must perform.

(3 marks)

d. Identify **TWO (2)** features of the Intel Celeron microprocessor.

(2 marks)

QUESTION 2 [10 Marks]

a. Convert the following binary numbers to decimal equivalents. Show computation steps.
   i. 11100001.110_2
   ii. 11010100.001_2

(3 marks)

b. Convert the following hexadecimal notations to their binary equivalents. Show computation steps.
   i. $68D.9A_{16}$
   ii. $3B6.F5_{16}$

(3 marks)

c. Convert the following octal notations to decimal equivalents. Show computation steps.
   i. 163_8
   ii. 0.56_8

(2 marks)

d. Assume that you have a logic gate shown in **Figure 1** with three inputs, X, Y and Z. Determine the output (E) for the following questions.
   i. X = 0, Y = 1, Z = 0
   ii. X = 0, Y = 1, Z = 0

(2 marks)

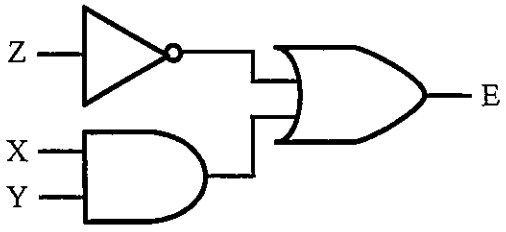

Figure 1

Continued...

QUESTION 3 [10 Marks]

a. Calculate the addition arithmetic operation of the following unsigned binary numbers. Show computation steps.
   i. 11100100 + 01101011
   ii. 11001110 + 11101101

(2 marks)

b. Calculate the subtraction arithmetic operation of the following unsigned binary numbers. Show computation steps.
   i. 10010000 - 01011010
   ii. 01111000 - 01100001

(3 marks)

c. Solve the following addition operations using the two's complement addition in 5-bit for signed integer. Show computation steps.
   i. (-7) + (9)
   ii. 9 + (-5)

(3 marks)

d. Solve the subtraction operation (-7) - (-3) using the two's complement subtraction in 4-bit for signed integer. Show computation steps.

(2 marks)

QUESTION 4 [10 Marks]

a. What is the function of accumulator in assembly language of 8085 microprocessor?

(2 marks)

b. Explain the meaning of the following assembly language instructions code.
   i. MVI A, 45H
   ii. MOV B, C
   iii. LDA 5001H
   iv. STA 2030H

(4 marks)

c. Let the memory location 4000H = E2H, 4001H = 73H and 4002H = 38H. Write an assembly language to subtract the contents of the memory locations 4001H and 4002H from the memory location 4000H by using indirect addressing mode. Store the result of the operation to memory location 4005H.

(4 marks)

Continued...

QUESTION 5 [10 Marks]

a. Operating systems have evolved through a number of distinct phases or generations which corresponds roughly to the decades. In third generation of operating systems, the operating system designers developed a multiprogramming concept. Briefly describe what multiprogramming is.

(2 marks)

b. In operating system, a process is a program in execution. As a process executes, it changes state. The state of a process is defined as the current activity of the process. List and briefly describe **THREE (3)** of the states that a process can have at a time in process management.

(3 marks)

c. Discuss any **TWO (2)** examples of utility programs.

(2 marks)

d. The most important part where file systems are likely to be different is the structure and the connection of the directories between them. Briefly describe **THREE (3)** common directory structures used in file system of operating system.

(3 marks)

End of Paper